Appendix C
Aviation Weather Programs and Projects
Historical Context

THE NATIONAL AVIATION WEATHER PROGRAM COUNCIL

In April 1997, the National Aviation Weather Program Council approved and published a *National Aviation Weather Program Strategic Plan*, which had been developed by the Council's Joint Action Group for Aviation Weather (OFCM 1997). The *Strategic Plan* was the first step in a federal agency response to the challenge for improved aviation weather safety set forth in a National Research Council report, *Aviation Weather Services—A Call for Federal Leadership and Action* (NRC 1995). The Federal Coordinator, who serves as Chair of the National Aviation Weather Program Council, has coordinated the federal response, as well as other activities to support and implement the *Strategic Plan*. These activities draw on the resources of the Joint Action Group for Aviation Weather and the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM).

In the 1997 *Strategic Plan*, the National Aviation Weather Program Council took responsibility for overseeing periodic reviews of the program to provide mid-course corrections as needed, as well as to maintain momentum as the plan progressed. The OFCM was assigned a supporting role in providing analyses, summaries, and evaluations as "a factual basis for the executive and legislative branches to make appropriate decisions related to the allocation of funds" (OFCM 1997, pp. 3, 25).

The next major step toward coordinating the many federal and nonfederal programs relevant to improving aviation weather safety was another report prepared by the Joint Action Group for Aviation Weather, *National Aviation Weather Initiatives*. It was approved by the National Aviation Weather Program Council and released in February 1999. The *Initiatives* report identified ongoing and planned programs of the federal agencies, including federally funded academic research (OFCM 1999).

Early In 2001, the OFCM completed a comprehensive analysis of programs and projects that had been identified as meeting the needs and concerns compiled in the *National Aviation Weather Initiatives* report. Programs led by or involving participation of federal agencies, industry, universities, and associations were included. The results of this analysis were presented in the first release (April 2001) of the *National Aviation Weather Initiatives Final Baseline Tier 3/4 Report* (OFCM 2001).[1] Since the baseline release, the Tier 3/4 report has become a living document, with ongoing additions of new programs and updates on the status of programs in progress. An update was issued in December 2003 (OFCM 2003a). This report constitutes another update in the series.

[1] The *National Aviation Weather Program Strategic Plan* (OFCM 1997) constitutes Tier 1. The initiatives set forth in *National Aviation Weather Initiatives* (OFCM 1999) constitute Tier 2. Tiers 3 and 4 consist of the individual programs and projects identified as relevant to the aviation service areas and initiatives.

In a memorandum to the members of the Committee for Aviation Services and Research dated January 27, 2003, the Federal Coordinator asked the agencies to review and update the National Aviation Weather Initiatives as appropriate. The input from the agencies included no major changes to the initiatives as defined in the *Baseline Tier 3/4 Report*. There was general agreement that the current service areas sufficiently cover the weather hazards and that the Convection, In-Flight Icing, Ceiling & Visibility, Turbulence, and Terminal Winds service areas have the highest priority. The agencies made no changes to the relative (star) rankings. There were two new focus areas proposed: verification and base-lining national performance standards by the National Weather Service and stratospheric operations by the U.S. Air Force.

ACCIDENT REDUCTION GOALS FOR WEATHER-RELATED ACCIDENTS

In February 1997, the White House Commission on Aviation Safety and Security recommended a national goal for government and industry of reducing the rate of fatal aviation accidents by a factor of five (an 80 percent reduction) within 10 years. Safety research and technology improvements were recognized as essential elements in achieving this goal. Subsequently, both the Federal Aviation Administration (FAA) and the National Aeronautics and Space Administration (NASA) adopted the 80 percent reduction goal in their strategic plans.

The 1999 report by the Joint Action Group for Aviation Weather, *National Aviation Weather Initiatives*, included initiatives underway in the aviation industry and programs with industry, academic, and governmental partners. Furthermore, it adopted the 80 percent reduction goal and suggested that a reduction in weather-related accidents, as shown by National Transportation Safety Board (NTSB) accident statistics, could be used as an overall measure of success for the portfolio of aviation weather initiatives.

The NTSB uses categories for commercial air carriers and general aviation defined by three parts of the Federal Aviation Regulations (Title 14, U.S. Code of Federal Regulations):

- Part 91 covers all aviation other than military or commercial. In addition to privately owned and operated single and multiple engine propeller craft often thought of as general aviation, it includes private company jets, rotorcraft, gliders, balloons, experimental aircraft, aerial application flying (e.g., agricultural aviation), and instructional flying.
- Part 121 includes the major passenger airlines and cargo carriers that fly large transport-category aircraft in revenue service. In March 1997, the definition of Part 121 was changed to include all passenger aircraft operated in scheduled revenue service with 10 or more seats. Since 1997, therefore, most carriers that are popularly known as commuter airlines are included in Part 121.
- Part 135 includes scheduled passenger service in aircraft with fewer than 10 seats and nonscheduled operations. The nonscheduled operations refer to revenue-earning flights in which the departure time, departure location, and

> arrival location are specifically negotiated with the customer or the customer's representative. All cargo flights that come under Part 135 are in the nonscheduled subcategory, as are air taxi services. Private carriage operations with a passenger-seat configuration of 20 seats or fewer and a payload capacity of 6,000 pounds or less come under the nonscheduled Part 135 operations, as do cargo operations in aircraft having a payload capacity of 7,500 pounds or less.

The NTSB reports annual data for Part 121 and the two categories (scheduled and nonscheduled) of Part 135 in the *Annual Review of Aircraft Accident Data for U.S. Air Carrier Operations.* The data for Part 91 are published as a separate series, the *Annual Review of Aircraft Accident Data for U.S. General Aviation*.

In August 2003, the OFCM released the *National Aviation Weather Program Mid-Course Assessment* (OFCM 2003b). The *Mid-Course Assessment* adopted the 80 percent reduction in accidents, from the level circa 1996, as a benchmark for assessing progress and seeking areas where more effort, or a redirection of effort, may be worthwhile. It adopted the analytical approach of "distributing the goal of an 80 percent reduction in fatal accidents across the three principal regulatory categories for aircraft and across categories for weather-related aviation hazards." In each category analyzed, an 80 percent reduction from the accident rate around 1996 was calculated as a target against which to assess progress in that category. As the report noted,

> … the overall national goal can be met without achieving an 80 percent reduction in each category used for analysis. (It may even be preferable, for various reasons, to seek greater reductions in some areas than others.) Still, this common yardstick for "success" provides a convenient and useful starting point for assessing progress and considering mid-course corrective actions.
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> (OFCM 2003b, pp. 1-2)

The data analyses and graphs included in Appendix D of this report use the same approach as the *Mid-Course Assessment*. However, the final NTSB data for 2002 are now included in the tables and analyses. These updated analyses and comparisons with the trends established in the *Mid-Course Assessment* provide the basis for the discussion of *Weather Hazard Accident Trends* in the opening narrative of this update. To identify accident trends involving similar weather hazards, the *Mid-Course Assessment* grouped the weather factors cited in the NTSB reports into the following eight hazard categories, which have been used again for this year's update:

- Restricted visibility and ceiling hazards
- Precipitation (non-icing) hazards
- Icing conditions
- Turbulence and convection hazards
- Temperature and lift hazards
- En route and terminal winds

- Airborne solids hazards
- Other

The tabulation of 2002 accident reports in Appendix D lists the specific weather factors cited by the NTSB under each of these hazard categories.